

R_{dA} of π^0 and γ in d+Au collisions at 200 GeV

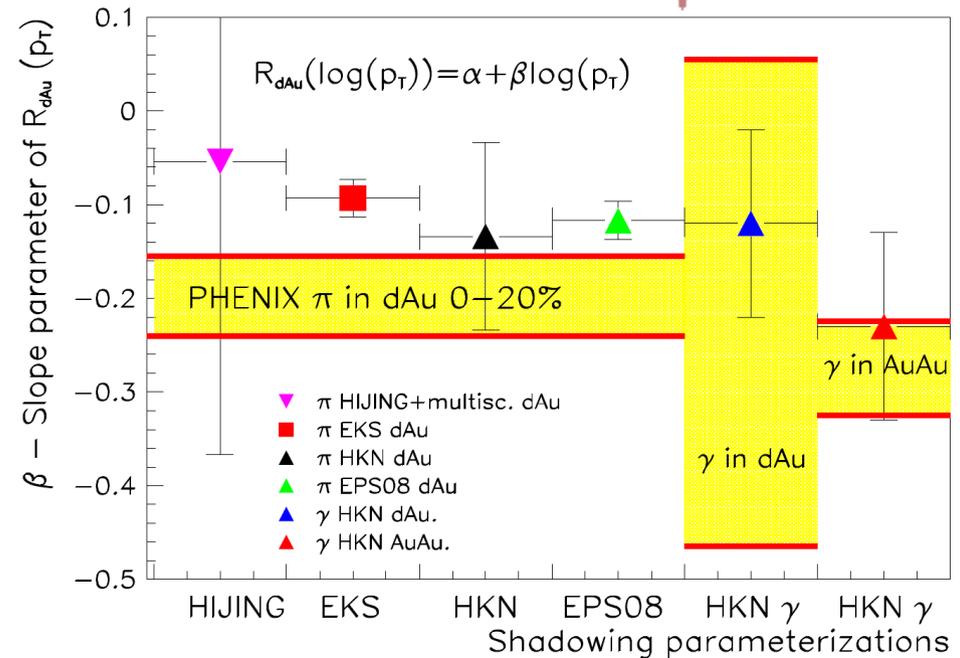
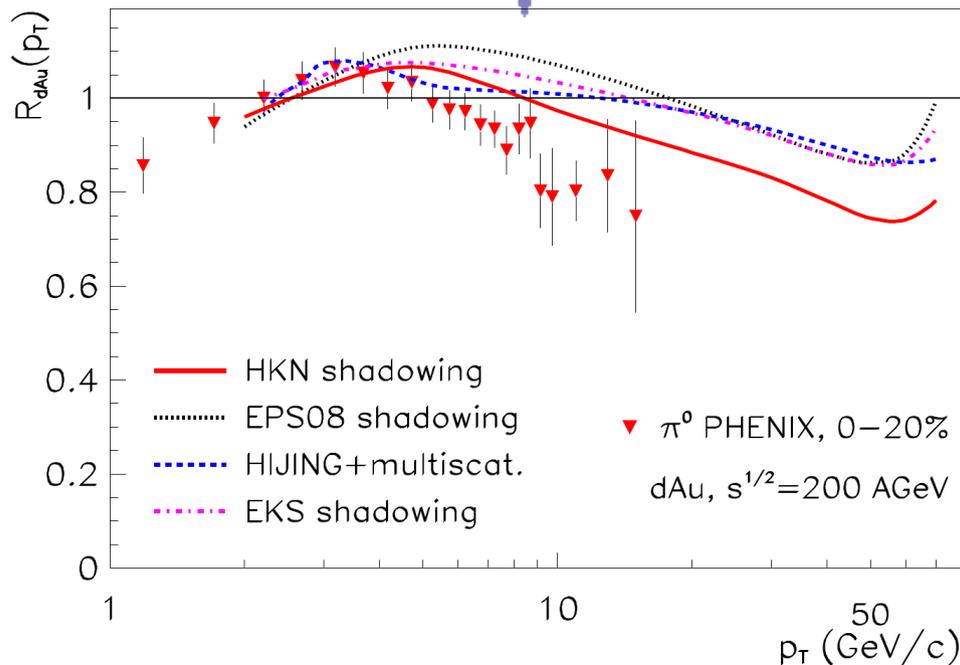
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for the PHENIX collaboration



Cold nuclear matter effects? (CNM)

Quantitative description of medium properties necessitates understanding of CNM

- 2002 large hadron suppression in AuAu attributed to energy loss in medium ("final state effect")
- 2003 CNM control: first dAu results seem to confirm little or no change of initial state
- 2006 hint of direct photon suppression in central AuAu at high p_T (cannot be a final state effect!)
- 2007 final results from the 2003 dAu run show some suppression at high p_T
must be some **initial state effect**, but **insufficient precision to quantify the effects**
- 2008 new dAu dataset (~ 30 times larger) to extend the p_T range, decrease errors and quantify CNM (modification of structure functions, shadowing, saturation, cold quenching etc.).

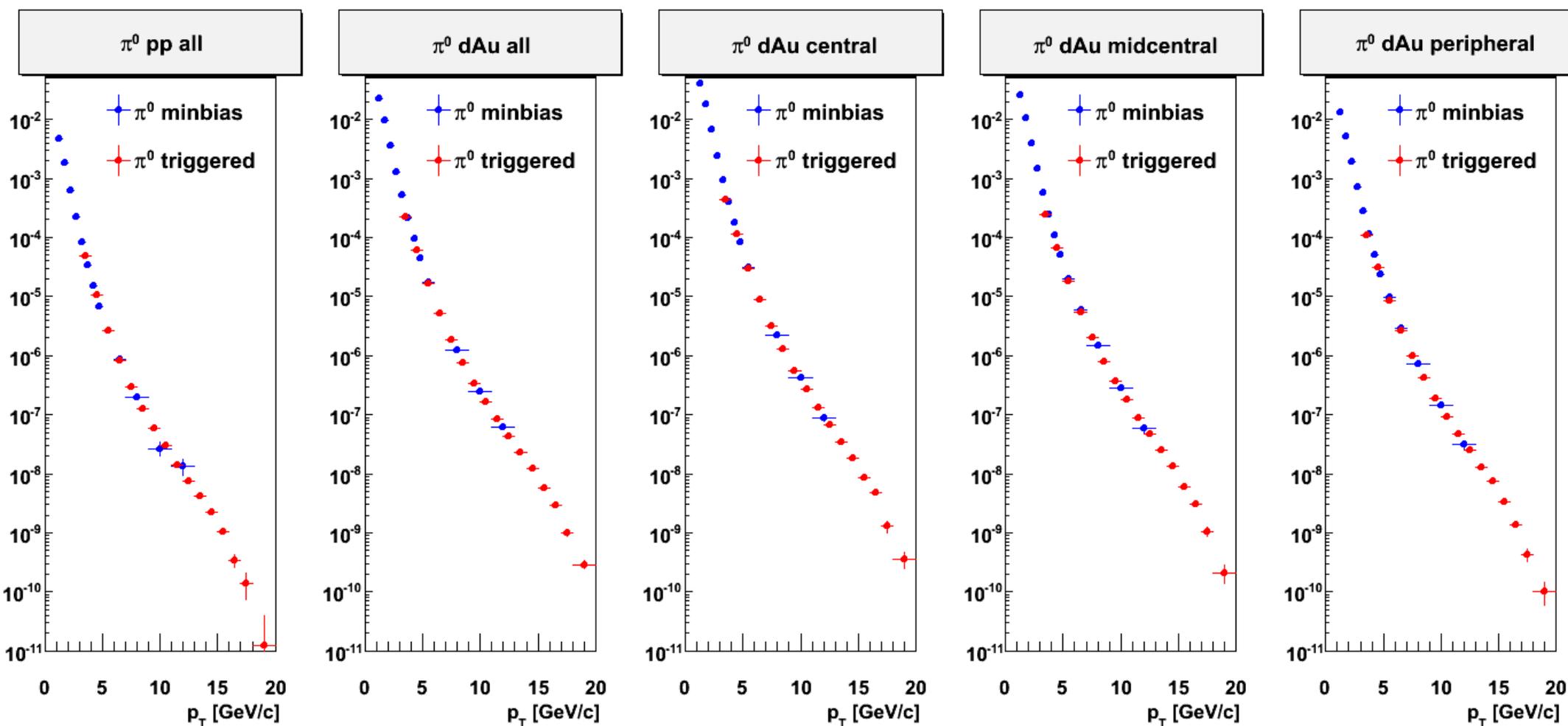


From: G. G. Barnafoldi, G. Fai, P. Levai, B. A. Cole and G. Papp, arXiv:0805.3360 [hep-ph]

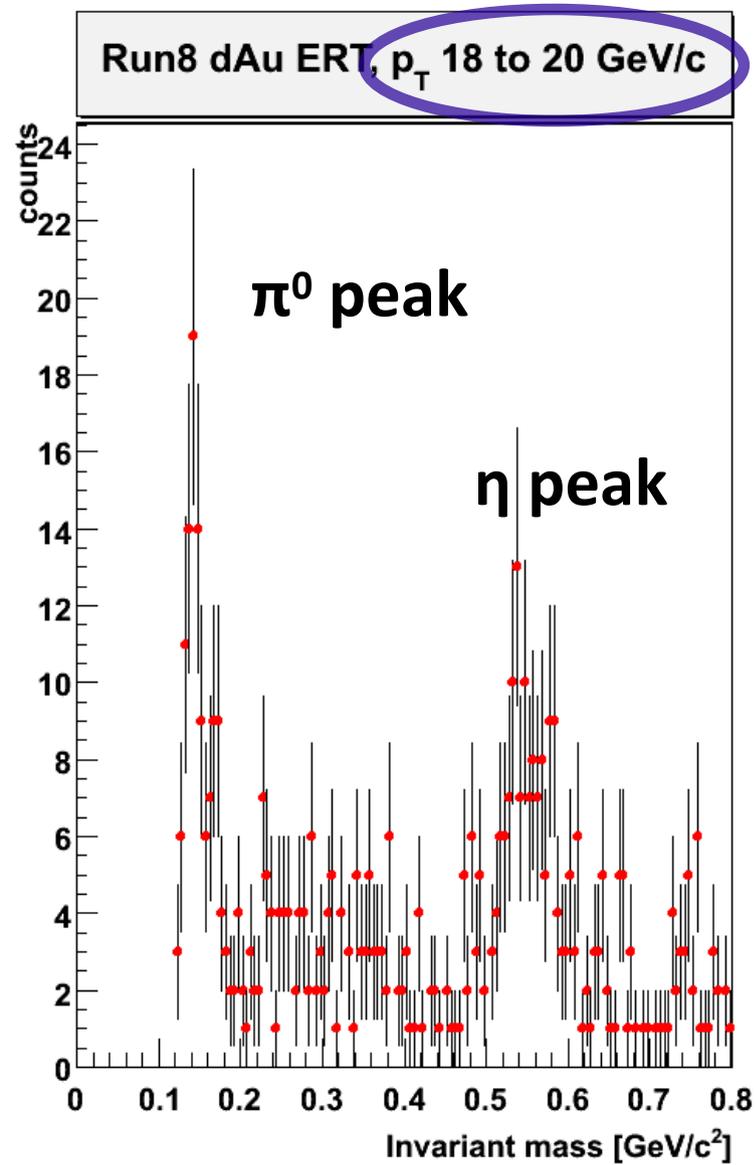
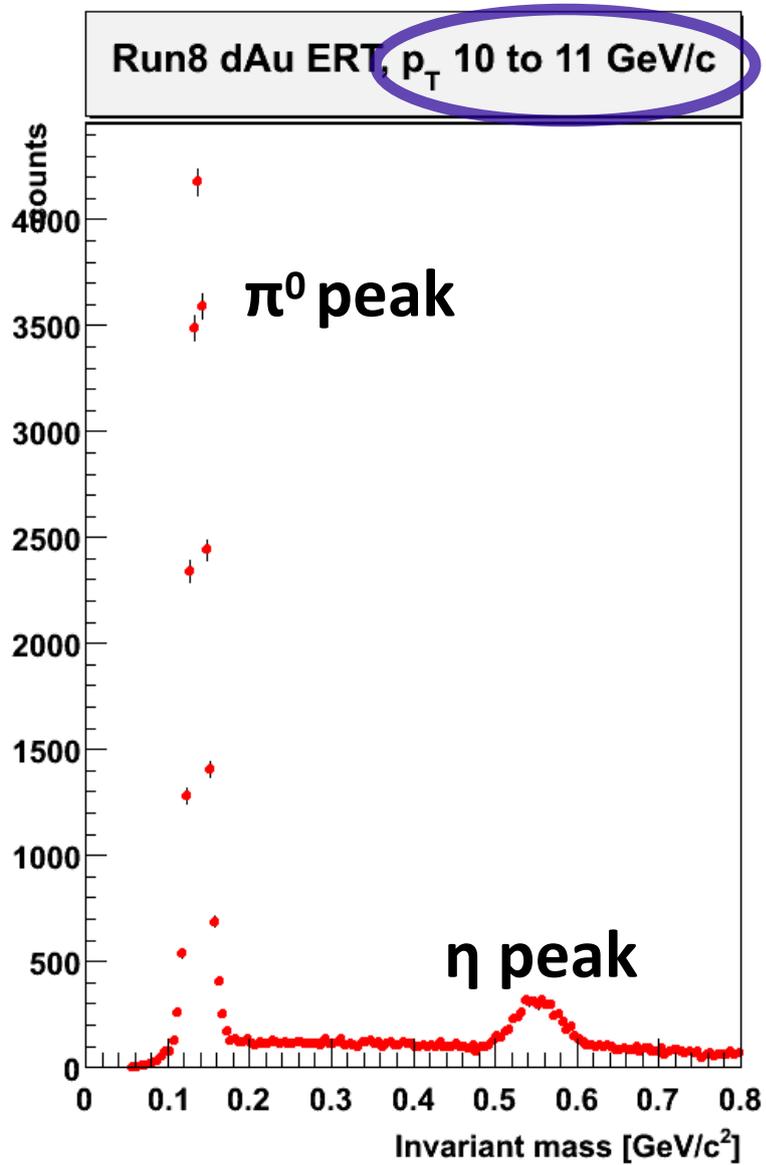
Year 2008 data: $\sim 30x$ more statistics
spanning nine orders of magnitude

	min bias	triggered
p + p	529 M	1170 M
d + Au	1649 M	3680 M

Uncorrected inclusive π^0 yields at $y=0$. (Note the stat. error bars)



Invariant mass spectrum of gamma+gamma pairs in PbSc



R_{dAu} precision of 10-20 % at $p_T \sim 20 \text{ GeV}/c$ feasible with 2008 data for π^0 , η , and direct photons